



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of Taisuke HIROOKA et al.

Serial Number: 09/337,278

Art Unit: 1746

Filed: June 22, 1999

Examiner: J. Smetana

For: CLEANING AND HANDLING METHODS OF ELECTRONIC COMPONENT AND  
CLEANING APPARATUS THEREOF

#15

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents  
Washington, D.C. 20231

RECEIVED

MAY 23 2002

Sir:

TC 1700

I, Taisuke HIROOKA, do hereby declare as follows:

That I am a citizen of Japan, residing at 1-2-19, Kunitamadori, Nada-ku, Kobe-shi, Hyogo Japan.

That I completed the first half of the doctoral course in human environmental science at the graduate school of Kyoto University and have worked since 1996 at Sumitomo Special Metals Co., Ltd. (the assignee of record of the above-identified patent application) and have been engaged in thin film-forming process at the Research and Development Center of the company.

That I am one of the joint inventors of the invention described and claimed in the above-identified patent application and, as such, am fully familiar with the invention described in the application, as well as the rejection of the claims over the prior art, in particular Miyashita et al., U.S. Patent No. 6,167,583.

That I conducted the experiments described below to test cleaning waters having a resistivity of  $5M\Omega$  or less for comparison with cleaning waters having a resistivity exceeding  $5M\Omega$ .

Experiments

The resistivity values of cleaning waters and the cleaning degrees of objects

to be cleaned were measured.

An alumina titanium carbide wafer having a diameter of four inches was used as the objects to be cleaned. As the cleaning waters, carbon dioxide gas was supplied to superpure(deionized) water while adjusting its flow rate, and the resistivities were adjusted to 0.1 to 17M $\Omega$ .

In the cleaning process, the alumina titanium carbide wafers having a diameter of four inches were used and each number of particles on the wafers was previously measured, time of one brushing cleaning step was set to 30 seconds, and spin dry was carried out thereafter.

Each number of particles on the wafers was measured using Surfscan made by Tencor Corp. (laser type particle counter having resolving power of 0.5 $\mu$ m or more).

Each number of particles remained on each surface of the alumina titanium carbide wafers was measured, and the result is shown in the figure attached hereto as elimination rate.

As shown in the figure, it was confirmed that the elimination rate of the particles is extremely increased as the resistivity of the cleaning water becomes 5M $\Omega$  or less.

The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this 11th day of March, 2002



Taisuke HIROOKA

